



**U.S. EPA REGION III  
Office of Analytical Services and Quality Assurance  
Fort Meade, Maryland**

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**OASQA LABORATORY REPORT**

**ELKTON FARMS**

**Lab Request #: REQ03158**

**Request Form #: DAS R31620**

Report prepared on: July 14, 2003

Approval for release:

A handwritten signature in cursive script, reading "Susan Warner", is written over a horizontal line.

OASQA Representative

Site contact(s): Lorie Baker (3HS34)  
Alex Cox

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SITE NAME: ELKTON FARMS

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## SAMPLE DESCRIPTIONS

<u>Sample #</u>	<u>Station</u>	<u>Description</u>	<u>Matrix</u>	<u>Type</u>	<u>End Collection</u>	
					<u>Date</u>	<u>Time</u>
03052201	GWT1	GWT1	Ground Water	GRAB	05/21/2003	09:30
03052202	GWT2	GWT2	Ground Water	GRAB	05/21/2003	10:00
03052203	GWT3	GWT3	Ground Water	GRAB	05/21/2003	10:30
03052204	MW1	MW1	Ground Water	GRAB	05/21/2003	08:50
03052205	MW2	MW2	Ground Water	GRAB	05/21/2003	09:40
03052206	MW3	MW3	Ground Water	GRAB	05/21/2003	11:00
03052207	MW4	MW4	Ground Water	GRAB	05/21/2003	11:15
03052208	MW5	MW5	Ground Water	GRAB	05/21/2003	09:40
03052209	MW6	MW6	Ground Water	GRAB	05/21/2003	11:45

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## TESTS REQUESTED

### INORGANICS

030522

	01	02	03	04	05	06	07	08	09
Perchlorate by IC	X	X	X	X	X	X	X	X	X

### ORGANICS

030522

	01	02	03	04	05	06	07	08	09
Nitroaromatics and Nitramines by HPLC	X	X	X	X	X	X	X	X	X

(X = Test Requested)

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QUALIFIER CODE AND GLOSSARY DEFINITIONS

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## QUALIFIER CODES:

< Sample value is below the quantitation limit. Quantitation limit reported.  
</= Reported value is estimated. Sample was analyzed in duplicate, one value is equal to or above the quantitation limit and one below. Average of quantitation limit and detected value reported.  
> Sample value is above the quantitation range.  
A Quality control value is outside acceptance limits.  
B Not detected substantially above (10 times) the level reported in the laboratory or field blanks (includes field, trip, rinsate, and equipment blanks).  
C See report narrative for analyst's observations concerning this result.  
D Sample and duplicate values are below the quantitation limit. Quantitation limit reported.  
E Value exceeds a theoretically greater value (e.g. dissolved > total, orthophosphate > total phosphorus). However, the difference is within the expected precision of the analytical techniques and is not statistically significant.  
I An interference exists which masks true response. See report narrative for explanation.  
J Analyte present. Reported value is estimated; concentration is outside the range for accurate quantitation.  
K Analyte present. Reported value may be biased high. Actual value is expected to be lower.  
L Analyte present. Reported value may be biased low. Actual value is expected to be higher.  
N Presumptive evidence indicates the presence of the compound. Special methods and/or method modifications may be needed to confirm its presence or absence in future sampling efforts.  
NA Analysis was not requested.  
Q No analytical results. See report for explanation.  
R Unreliable results. Analyte may or may not be present in the sample. Supporting data is necessary to confirm results.  
T Tentatively Identified Compound. Identified as a result of a library search using the EPA/NIH Mass Spectral Library.  
Authentic standards were not available to properly identify and quantitate the compound. The reported concentration is an estimate.  
TD Spike recovery too dilute for accurate quantitation.  
UJ Not detected. Quantitation limit is estimated.  
UL Not detected. Quantitation limit is probably higher.

## GLOSSARY:

() Numbers in parentheses are analytical spike recoveries (e.g. post-digestion spikes).  
[] Numbers in brackets are matrix spike recoveries (e.g. pre-digestion spikes).  
MS/MSD Matrix spike/matrix spike duplicate; a known increment of target analyte made to a sample before preparation or analyses.  
MSA Method of Standard Additions.  
RPD Relative Percent Difference; the results for duplicate analyses are presented as the mean and the relative percent difference.

$$RPD = \frac{|\text{Replicate1} - \text{Replicate2}|}{(\text{Replicate1} + \text{Replicate2})/2} \times 100$$

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INORGANIC ANALYTICAL SAMPLE RESULTS

SAMPLE NUMBER:	03052201	03052202	03052203	03052204	03052205
STATION ID:	GWT1	GWT2	GWT3	MW1	MW2
	SAMPLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE
Perchlorate by IC					
Perchlorate	<4.00 ug/L	<4.00 ug/L	<4.00 ug/L	<4.00 ug/L	<4.00 ug/L

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INORGANIC ANALYTICAL SAMPLE RESULTS

SAMPLE NUMBER:	03052206	03052207	03052208	03052209
STATION ID:	MW3	MW4	MW5	MW6
	SAMPLE	SAMPLE	SAMPLE	SAMPLE
Perchlorate by IC				
Perchlorate	<4.00 ug/L	<4.00 ug/L	<4.00 ug/L	<4.00 ug/L

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## INORGANIC QUALITY CONTROL RESULTS

SAMPLE NUMBER: 03052203

03052206

STATION ID: GWT3

MW3

Units:	% REC	RPD	% REC	RPD
Perchlorate by IC				
Perchlorate	[ 102]	D	[ 100]	D

[] = LSF

() = ISF

## **Perchlorate Determination**

### **Analyst:**

Ronald H. Altman  
Chemist

### **Method:**

The ELKTON FARMS water samples (REQ03158) were analyzed for Perchlorate using EPA Method 314.0<sup>1</sup> (Determination of Perchlorate in Drinking Water using Ion Chromatography). The water samples were filtered through a Gelman glass fiber filter Type A/E 47 mm. In addition, a laboratory reagent blank (LRB), laboratory fortified blank (LFB), laboratory fortified blank at the maximum conductivity threshold (LFB at MCT), a matrix duplicate (LD2) and a matrix spike (LSF) were also prepared and taken through the process.

<sup>1</sup> US EPA Method 314.0, Determination of Perchlorate in Drinking Water Using Ion Chromatography, Revision 1.0, November 1999



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## ORGANIC ANALYTICAL SAMPLE RESULTS

	Sample Number:	03052201	03052202	03052203	03052204	03052205
	Station ID:	GWT1	GWT2	GWT3	MW1	MW2
		SAMPLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE
Nitroaromatics and Nitramines by HPLC						
4-Amino-2,6-dinitrotoluene		4.4 ug/L	2.8 ug/L	0.21 ug/L		
2-Amino-4,6-dinitrotoluene		5.1 ug/L	2.4 ug/L	0.08 ug/L		
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)		0.32 I ug/L				
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)		UL ug/L	UL ug/L	UL ug/L	UL ug/L	UL ug/L
1,3,5-Trinitrobenzene		0.59 ug/L				
2,4,6-Trinitrotoluene		5.0 ug/L	0.32 ug/L			

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ORGANIC ANALYTICAL SAMPLE RESULTS

Sample Number:	03052206	03052207	03052208	03052209
Station ID:	MW3	MW4	MW5	MW6
	SAMPLE	SAMPLE	SAMPLE	SAMPLE

Nitroaromatics and Nitramines by HPLC

4-Amino-2,6-dinitrotoluene			0.15 ug/L	
2-Amino-4,6-dinitrotoluene				
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)				
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	UL ug/L	UL ug/L	UL ug/L	UL ug/L
1,3,5-Trinitrobenzene				
2,4,6-Trinitrotoluene				

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## ORGANIC QUALITY CONTROL (SURROGATE RECOVERIES)

Matrix: WATER

	SAMPLE NUMBER:	03052201	03052202	03052203	03052204	03052205	03052206	03052207	03052208
	STATION ID:	GWT1	GWT2	GWT3	MW1	MW2	MW3	MW4	MW5
<u>SURROGATES</u>	<u>LIMITS</u>	<u>SAMPLE</u>	<u>SAMPLE</u>	<u>SAMPLE</u>	<u>SAMPLE</u>	<u>SAMPLE</u>	<u>SAMPLE</u>	<u>SAMPLE</u>	<u>SAMPLE</u>
Nitroaromatics and Nitramines by HPLC	Range	% REC	% REC	% REC	% REC	% REC	% REC	% REC	% REC
1,2-Dinitrobenzene	(70-130)	115	91	89	102	92	96	91	100

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ORGANIC QUALITY CONTROL (SURROGATE RECOVERIES)

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Matrix: WATER

SAMPLE NUMBER: 03052209

STATION ID: MW6

SURROGATESLIMITSSAMPLE

Nitroaromatics and Nitramines by HPLC

Range

% REC

1,2-Dinitrobenzene

(70-130)

72

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ORGANIC LABORATORY REAGENT BLANK RESULTS

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Nitroaromatics and Nitramines by HPLC

Date Prepared: MAY-23-2003

SURROGATES

1,2-Dinitrobenzene

85

% REC

ANALYTESMethyl-2,4,6-trinitrophenylnitramine  
(Tetryl)

UL

ug/L

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## SUPPLEMENTAL SAMPLE INFORMATION

## Nitroaromatics and Nitramines by HPLC

<u>SAMPLE #</u>	<u>SAMPLE NQL FACTOR</u>
03052201	1
03052202	1
03052203	1
03052204	1
03052205	1
03052206	1
03052207	1
03052208	1
03052209	1

NQL Factor is an overall correction factor applied to the method's Nominal Quantitation Limit to correct for analytical adjustments made during the analysis.

**USEPA Region III  
Office of Analytical Services and Quality Assurance (OASQA)  
Nitroaromatic and Nitramine Analysis  
Nominal Quantitation Limits (NQL)**

Units: Water = ug/L

Actual Quantitation Limit = (NQL Factor) X NQL

CAS #	Compound	NQL
35572-78-2	2-Amino-4,6-dinitrotoluene (2-Am-DNT)	0.13
99-65-0	1,3-Dinitrobenzene (1,3-DNB)	0.13
121-14-2	2,4-Dinitrotoluene (2,4-DNT)	0.13
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.26
98-95-3	Nitrobenzene (NB)	0.13
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.26
99-35-4	1,3,5-Trinitrobenzene (1,3,5-TNB)	0.13
118-96-7	2,4,6-Trinitrotoluene (TNT)	0.13
1946-51-0	4-Amino-2,6-Dinitrotoluene (4-Am-DNT)	0.13
88-72-2	2-Nitrotoluene (2-NT)	0.13
99-08-1	3-Nitrotoluene (3-NT)	0.13
99-99-0	4-Nitrotoluene (4-NT)	0.13
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	0.26
606-20-2	2,6-Dinitrotoluene (2,6-DNT)	0.13

The "Nominal Quantitation Limit" listed for each target compound is based on the Superfund CLP Protocol. The Actual Quantitation Limits are related to the NQLs by the NQL Factor. This NQL Factor reflects procedural steps, e.g., extract dilution, which influence quantitation limits.

## **Nitroaromatic and Nitramine Analysis by HPLC**

### **Analyst:**

Jennifer Gundersen  
Chemist

### **Method:**

Nine aqueous samples from ELKTON FARMS (REQ03158) were received for analysis of nitroaromatic/nitramine explosives (SW-846 Method 8330 analytes). The samples were collected May 21, 2003, extracted on May 23, 2003 and analyzed May 24 and 27, 2003. All samples were extracted and analyzed according to R3-QA221.0, a combined method based on SW-846 Methods 8000B and 8330.

Samples 030522-01 and 030522-02 were subjected to multiple dilutions because of the presence of target analytes above the calibration range of the instrument.

Only detected results are reported.

### **Quality Control:**

All samples were extracted and analyzed within holding time.

Initial calibration was within acceptance limits.

Second source calibration verification was within acceptance limits with the exception of tetryl. Tetryl was not detected in any samples. Results have been flagged "UL".

All continuing calibrations were within acceptance limits.

All surrogate recoveries were within limits.

A matrix spike/matrix spike duplicate could not be run because sufficient sample was not provided by the sampler.

Recoveries of lab fortified blanks and audits were within limits.

Lab instrument and reagent blanks showed no contamination.

Field blanks were not provided by the sampler.

Sample 030522-01 appeared to contain RDX but a coeluting contaminant prevented definitive identification. The result has been qualified "T" noting the interference and directing the user to this narrative. Results for RDX are considered biased high due to the interference.





**USEPA Contract Laboratory Program**  
**Generic Chain of Custody**

Key 03158  
F# 03139  
D.D. 7.21.03

Reference Case 31738

Client No: R31583

SDG No:

L

Date Shipped: 5/21/2003 Carrier Name: Hand Delivery Airbill: Shipped to: OASQA USEPA Region III 701 Mapes Road Fort Meade MD 20755 (410) 305-2667	<b>Chain of Custody Record</b>		<b>Sampler Signature</b> <i>[Signature]</i>	<b>For Lab Use Only</b> Lab Contract No: _____ Unit Price: _____ Transfer To: _____ Lab Contract No: _____ Unit Price: _____	
	Relinquished By	(Date / Time)	Received By		(Date / Time)
	1 <i>[Signature]</i>	5/21/03 1300	Peggy Smith		5/21/03 1330
	2 <i>[Signature]</i>	5/21/03 1600	St. Harris		5-21-03 1600
	3				
4					

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	FOR LAB USE ONLY Sample Condition On Receipt
GWT1	Ground Water/ Gifawossen Tefera <i>CT</i>	L/G	NIT_ARO (21), PER (21)	1290 (Ice Only), 1291 (Ice Only) (2)	GWT1	S: 5/21/2003 9:30	03052201
GWT2	Ground Water/ Brian Dietz <i>BD</i>	L/G	NIT_ARO (21), PER (21)	1298 (Ice Only), 1299 (Ice Only) (2)	GWT2	S: 5/21/2003 10:00	02
GWT3	Ground Water/ Gifawossen Tefera <i>CT</i>	L/G	NIT_ARO (21), PER (21)	1306 (Ice Only), 1307 (Ice Only) (2)	GWT3	S: 5/21/2003 10:30	03
MW1	Ground Water/ Dixon Wood <i>DW</i>	L/G	NIT_ARO (21), PER (21)	1314 (Ice Only), 1315 (Ice Only) (2)	MW1	S: 5/21/2003 8:50	04
MW2	Ground Water/ Dixon Wood <i>DW</i>	L/G	NIT_ARO (21), PER (21)	1322 (Ice Only), 1323 (Ice Only) (2)	MW2	S: 5/21/2003 9:40	05
MW3	Ground Water/ Dixon Wood <i>DW</i>	L/G	NIT_ARO (21), PER (21)	1340 (Ice Only), 1341 (Ice Only), 1342 (Ice Only), 1343 (Ice Only) (4)	MW3	S: 5/21/2003 11:00	06
MW4	Ground Water/ Brian Dietz <i>BD</i>	L/G	NIT_ARO (21), PER (21)	1350 (Ice Only), 1351 (Ice Only) (2)	MW4	S: 5/21/2003 11:15	07
MW5	Ground Water/ Dixon Wood <i>DW</i>	L/G	NIT_ARO (21), PER (21)	1358 (Ice Only), 1359 (Ice Only) (2)	MW5	S: 5/21/2003 9:40	08
MW6	Ground Water/ Chris Hartman <i>CH</i>	L/G	NIT_ARO (21), PER (21)	1366 (Ice Only), 1367 (Ice Only) (2)	MW6	S: 5/21/2003 11:45	09

Shipment for Case Complete? <input checked="" type="checkbox"/>	Sample(s) to be used for laboratory QC: MW3	Additional Sampler Signature(s): <i>[Signature]</i> <i>[Signature]</i>	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? <input checked="" type="checkbox"/>	Shipment Iced? <input checked="" type="checkbox"/>
NIT_ARO = Nitroaromatics, PER = Perchlorates				

TR Number: 3-592370820-052103-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.  
Send Copy to: Sample Management Office, 2000 Edmund Halley Dr., Reston, VA. 20191-3400 Phone 703/264-9348 Fax 703/264-9222

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